

THE CLAIMS

What is claimed is:

- 5 1. A golf ball comprising a core and a cover, wherein at least one of the core and the cover
is formed of a composition comprising an organic, inorganic, or metallic nanoparticulate material
having a particle size of less than about 1000 nm and at least one matrix material.
- 10 2. The golf ball of claim 1, wherein the nanoparticulate material comprises platelets having
a diameter of about 0.9 nm to about 1000 nm and have an aspect ratio of about 100 to about
1000.
- 15 3. The golf ball of claim 1, wherein the composition further comprises a layered material
comprising phyllosilicates, smectite clay minerals, montmorillonite, sodium montmorillonite;
magnesium montmorillonite; calcium montmorillonite; nontronite; beidellite; volkonskoite;
hectorite; saponite; sauconite; sobockite; stevensite; svinfordite; vermiculite; micaceous
minerals; illite; mixed layered illite; smectite minerals; ledikite; admixtures of illites and
mixtures thereof.
- 20 4. The golf ball of claim 3, wherein the layered material comprises montmorillonite,
nontronite, beidellite, volkonskoite, hectorite, saponite, sauconite, sobockite, stevensite,
svinfordite, and mixtures thereof.
- 25 5. The golf ball of claim 3, wherein the layered material is swellable.
6. The golf ball of claim 1, wherein the composition comprises an inorganic material
comprising chemically-modified montmorillonite clays; polymer grade montmorillonites; and
mixtures thereof.
- 30 7. The golf ball of claim 1, wherein the composition comprises an organic material
comprising polyhedral oligomeric silsequioxanes.

8. The golf ball of claim 1, wherein the composition further comprises a second nanomaterial.
- 5 9. The golf ball of claim 8, wherein the second nanomaterial comprises carbon nanotubes; Fullerenes; nanoscale titanium oxides; iron oxides; modified ceramics; and mixtures thereof.
- 10 10. The golf ball of claim 1, wherein the matrix material comprises thermoplastics, thermoplastic elastomers, rubbers, thermoset materials, ionomers, copolyether-esters, copolyester-esters, copolyether-amides, copolyester-amides, thermoplastic urethanes, thermoset ureas, epoxy urethanes, epoxy ureas, phenolics, cross-linked polybutadiene rubbers, polyisoprenes, metallocene or single-site non-metallocene catalyzed polymers; and mixtures thereof.
- 15 11. The golf ball of claim 10, wherein the thermoset material comprises polyamides; polyesters; polyurethanes; polycarbonates; polyepoxides; and mixtures thereof.
- 20 12. The golf ball of claim 1, wherein the composition comprises nano-ZnO.
13. The golf ball of claim 12, wherein the ZnO is present in the core in an amount less than about 5 pph.
14. The golf ball of claim 1, wherein the nanoparticulate is metallic.
- 25 15. The golf ball of claim 14, wherein the metallic nanoparticulate comprises nano-tungsten, nano-zinc, nano-tin, or a mixture thereof.
16. The golf ball of claim 1, wherein the core comprises a solid, liquid, or gel-filled center.
- 30 17. The golf ball of claim 1, wherein the core comprises an outer core layer.

18. The golf ball of claim 17, wherein the outer core layer is a solid layer or a layer of tensioned elastomeric material.
- 5 19. The golf ball of claim 1, wherein the cover comprises an inner cover layer and an outer cover layer.
- 10 20. The golf ball of claim 19, wherein at least one of the inner and outer cover layers comprises a thermoplastic or thermoset polyurethane or thermoset polyurea.
21. The golf ball of claim 19, wherein the outer cover layer comprises saturated polyurethane.
22. The golf ball of claim 19, wherein the inner cover has a hardness, as measured on the ball, of less than about 75 Shore D.
23. The golf ball of claim 22, wherein the inner cover hardness, as measured on the ball, is between about 30 and about 70 Shore D.
24. The golf ball of claim 22, wherein the inner cover hardness, as measured on the ball, is between about 65 and about 70 Shore D.
25. The golf ball of claim 19, wherein the inner cover layer has a thickness of no greater than about 0.060 inches.
26. The golf ball of claim 25, wherein the inner cover layer has a thickness of no greater than about 0.055 inches.
27. The golf ball of claim 26, wherein the inner cover layer has a thickness of no greater than about 0.035 inches.

28. The golf ball of claim 1, wherein the golf ball has a compression of between about 70 and about 95.

5 29. The golf ball of claim 1, wherein the cover has a hardness, as measured on the ball, of less than about 70 Shore D.

30. The golf ball of claim 29, wherein the cover hardness, as measured on the ball, is no greater than about 61 Shore D.

10 31. The golf ball of claim 30, wherein the cover hardness, as measured on the ball, is no greater than about 55 Shore D.

15 32. The golf ball of claim 1, wherein the cover has a material hardness of less than about 70 Shore D.

33. The golf ball of claim 32, wherein the cover has a material hardness of no greater than about 58 Shore D.

20 34. The golf ball of claim 33, wherein the cover has a material hardness of no greater than about 48 Shore D.

35. The golf ball of claim 1, wherein the core has an outer diameter of no greater than about 1.620 inches.

25 36. The golf ball of claim 35, wherein the core has an outer diameter of no greater than about 1.550 inches.

37. The golf ball of claim 36, wherein the core has an outer diameter of no greater than about 1.510 inches.